Abstract:

There is no commercial application of modified atmosphere storage or packaging for cut flowers. The reason for that would be that the most decisive factor for keeping quality is a low temperature during storage and transport. In practice, however, this low temperature is not always realised. However it is worthwhile knowing potential quality benefits that may arise from the use of modified O_2 and/or CO_2 concentrations at sub-optimal temperatures. Experiments have been conducted on cut rose flowers 'First Red' to study the effect on postharvest physiology of different O_2 partial pressures (0.5-21 kPa) during 5 days at 12 °C. During this period of transport simulation at different O_2 partial pressures, respiration rate and ethylene production of the flowers was measured. During subsequent flower opening during vase life, diameter and longevity of the flowers were recorded. Fresh weight and area of single petals were measured daily. Growth during vase life of the inner and outer petal surfaces was estimated. Oxygen uptake rate and ethylene production were logarithmically related to O_2 partial pressure. To lower oxygen uptake rate to less than 50% of that in air, a partial pressure of O_2 should be <2 kPa. However, in the O_2 range <2 kPa the R(espiratory) Q(uotient) indicated anaerobic respiration. Vase life was not significantly affected by O_2 concentrations during a 5 day storage period. Low O_2 partial pressures during storage resulted in poor flower opening afterwards. Petal growth was not inhibited by low O_2-storage, but outer petals showed a greater increase in surface area and fresh weight after storage at 1 kPa O_2 than at higher O_2 partial pressures. Poor flower opening was the result of an increase in cell size at the upper region of the outer petal layer, which hampered outward reflex of the petals.